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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/029,608	05/15/1998	NORIO FUKASAWA	980233	6285

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EXAMINER

GRAYBILL, DAVID E

ART UNIT

PAPER NUMBER

2827

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/029,608

Applicant(s)

FUKASAWA ET AL.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 87-90, 109-112 and 115-131 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 87-90, 109-112 and 115-131 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 121 and 122 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. The undescribed subject matter is the entire claim language. To further clarify, it is noted that there is no support for the claimed particular relative dimensions for the semiconductor element on which the resin layer is formed.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 117-120 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claims 117 and 119 there is insufficient antecedent basis for the language "the end portions of the protruding electrodes that protrude from the resin layer."

In claim 119 there is insufficient antecedent basis for the language "the protruding core portion."

In the rejections infra, reference labels are generally recited only for the first recitation of identical claim language.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 87-90 are rejected under 35 U.S.C. 102(e) as being anticipated by Kata (5897337).

At column 4, line 8 to column 14, line 50, Kata teaches the following:

87. A semiconductor wafer on which semiconductor elements are provided, comprising: a semiconductor wafer 50 including a plurality of semiconductor elements having a surface on which

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electrode pads 41 connected to an internal part of the semiconductor elements and protruding electrodes 66 to be connected to an external part are formed; lead lines 62 each connecting one of the electrode pads and one of the protruding electrodes so that the protruding electrodes and the internal part are connected through the lead lines and a resin layer 61, 43 which is formed on the surface of the semiconductor elements and seals at least a lateral surface of the protruding electrodes; wherein the lead lines are located between the semiconductor elements and the resin layer.

88. A semiconductor device comprising: a semiconductor element having a surface on which, electrode pads connected to an internal part of the semiconductor element and protruding electrodes to be connected to an external part are formed; lead lines each connecting one of the electrode pads and one of the protruding electrodes so that the protruding electrodes and the internal part are connected through the lead lines; and a resin layer which is formed on the surface of the semiconductor element and seals at least a lateral surface of the protruding electrodes, wherein a lateral surface of the resin layer and a lateral surface of the semiconductor element have planes cut by a dicer, and the lead lines are located between the semiconductor element and the resin layer.

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89. A semiconductor device as in 88, wherein the lateral surface of the resin layer and the lateral surface of the semiconductor element have a common plane cut by a dicer.

90. A semiconductor device comprising: a semiconductor element having a surface on which external connection electrodes are provided, which are to be electrically connected to external terminals; and a compressed resin layer provided on the surface of the semiconductor elements so as to cover the external connection electrodes, wherein the external connection electrodes are exposed at a lateral surface of the compressed resin layer, the lateral surface of the resin layer and the lateral surface of the semiconductor element have planes cut by a dicer.

To further clarify the teaching of a compressed resin layer 43, it is noted that Kata teaches this product at column 8, lines 23-24; and column 9, lines 37-43 because the resin layer is inherently compressed when the film is pressed. In any case, the resin layer of Kata is flattened as though subjected to compression, and flattened laterally; therefore, it is compressed.

Also, although Kata does not appear to explicitly teach the process limitations of claims 88-90, the product of Kata inherently possesses the structural characteristics imparted by

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the limitations. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

Claims 109-112 and 131 are rejected under 35 U.S.C. 102(e) as being anticipated by Yasunaga (5656863).

At column 1, line 1 to column 2, line 5; column 3, lines 7-47; column 16, line 16 to column 18, line 12; and column 25, lines 44-47, Yasunaga teaches the following:

109. A semiconductor device comprising: a semiconductor element 113 having a surface on which protruding electrodes 112 are formed; a resin layer 111 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes 53b provided to the end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump.

110. The semiconductor device as in 109, wherein the resin layer and the semiconductor element have surfaces defined by cutting using a dicer.

111. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes 112 having convex end portions are formed; a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except the convex end portions thereof;

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and external connection protruding electrodes provided to the convex end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump.

112. The semiconductor device as in 111, wherein the resin layer and the semiconductor element have surfaces.

131. A semiconductor device comprising: a semiconductor element 3 having a surface on which protruding electrodes 9, 10 are formed; a compression-molded resin layer 1 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof ("top surface of the first conductor 9"); and external connection protruding electrodes 10 provided to the end portions of the protruding electrodes that protrude from the compression-molded resin layer, the compression-molded resin layer and the semiconductor element having surfaces.

Although Yasunaga does not appear to explicitly teach the process limitation, "wherein the resin layer and the semiconductor element have surfaces defined by cutting using a dicer," the product of Yasunaga inherently possesses the structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).



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Claims 115-120 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsubara (EP0385787).

At column 4, lines 2-8, and column 4, line 39 to column 5, line 20, Matsubara teaches the following:

115. A semiconductor device comprising: a semiconductor element 11 having a surface on which protruding electrodes 14 are formed; and a resin layer 13 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; the protruding electrodes having a core portion 14a and an electrically conductive film 14b1 formed on a surface of the core portion, wherein the core portion comprises an elastic resin.

116. The semiconductor device as claimed in 115, wherein the elastic resin is polyimide.

117. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes 14b2 provided to the end portions of the protruding electrodes that protrude from the resin layer, the protruding electrodes having a core portion and an electrically conductive film formed on a surface of the core portion.

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118. The semiconductor device as in 117, wherein an end portion of the electrically conductive film on a side on which the semiconductor element is located is electrically connected to the semiconductor element.

119. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes provided to the end portions of the protruding electrodes that protrude from the resin layer, the protruding electrodes having a core portion and an electrically conductive film formed on a surface of the protruding core portion, wherein the core portion comprises an elastic resin.

120. The semiconductor device as claimed in 119, wherein the elastic resin is polyimide.

Claims 121-123 are rejected under 35 U.S.C. 102(e) as being anticipated by Brooks (6043564).

At column 4, line 30 to column 5, line 4, Brooks teaches the following:

121. A semiconductor device comprising: a semiconductor element 104 having a surface on which protruding electrodes 130 are formed; and a resin layer 110 formed on the surface of the

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semiconductor element so as to seal the protruding electrodes except end portions 100 thereof, the semiconductor element having [in the vertical direction] an outer peripheral portion that is thinner than a central portion thereof.

122. A semiconductor device comprising a semiconductor element having a surface on which protruding electrodes are formed; and a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, the semiconductor element having [in the horizontal direction] an outer peripheral portion that is thicker than a central portion thereof, a part of a side portion of said semiconductor elements being exposed.

123. A semiconductor device comprising a semiconductor element having a surface on which protruding electrodes are formed; and a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, a part of a side portion of the semiconductor element being covered with the resin layer, a part of a side portion of said semiconductor elements being exposed.

Claims 124-130 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishino (JP555278).

In the English abstract and figures, Nishino teaches the following:

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124. A semiconductor device comprising: a semiconductor element 1 having a surface on which protruding electrodes 5 are formed; a resin layer 3 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and a protrusion 5 for positioning of the semiconductor device, the protrusion being formed on the surface of the semiconductor device and having an end portion exposed from the resin layer.

125. The semiconductor device as in 124, wherein the resin layer and the semiconductor element have surfaces defined by cutting using a dicer.

126. The semiconductor device as in 124, wherein the protrusion for positioning has a structure identical to that of the protruding electrodes.

127. A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; and a molded resin layer 3 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof.

128. The semiconductor device as in 127, wherein the molded resin layer and the semiconductor element have surfaces defined by cutting using a dicer.

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129. The semiconductor device as in 128, wherein the side surface of the resin layer and the side surface of the semiconductor element are flush with each other.

130. The semiconductor device as in 127, wherein end portions of the protruding electrodes protrude from the molded resin layer.

To further clarify the teaching of a protrusion 5 for positioning of the semiconductor device, it is noted that the protrusion is for positioning the semiconductor for external connection. In any case, the statement of intended use does not result in a structural difference between the claimed product and the product of Nishino. Further, because the product of Nishino is inherently capable of being used for the intended use the statement of intended use does not patentably distinguish the claimed product from the product of Nishino. Similarly, the manner in which a product operates is not germane to the issue of patentability of the product; *Ex parte Wikdahl* 10 USPQ 2d 1546, 1548 (BPAI 1989); *Ex parte McCullough* 7 USPQ 2d 1889, 1891 (BPAI 1988); *In re Finsterwalder* 168 USPQ 530 (CCPA 1971); *In re Casey* 152 USPQ 235, 238 (CCPA 1967). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what

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a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

To further clarify the teaching wherein the side surface of the resin layer and the side surface of the semiconductor element are flush with each other, it is noted that the sides of the resin layer and surface of the semiconductor that interface in direct contact are directly abutting and immediately adjacent each other; therefore, they are flush with each other.

Also, although Nishino does not appear to explicitly teach the process limitation "compression-molded," the product of Nishino inherently possesses the structural characteristics imparted by the process limitation. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980).

Applicant's amendment and remarks filed 1-18-02 are addressed in the rejection *supra* and are further addressed *infra*.

Applicant incorrectly indicates that claims 87-90 have been canceled because applicant has not requested cancellation of these claims.

Also, applicant argues that Nishino does not teach a compression-molded resin layer, and cites "Kawahara," "for facilitating understanding." However, applicant merely cites

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Kawahara without further elucidation, and the manner in which Kawahara facilitates understanding cannot be determined.

Applicant also asserts that Nishino does not teach a process of compression-molding. This assertion is respectfully deemed to be unpersuasive because Nishino is not relied on in the rejection for this teaching. To further clarify, it is noted that rejection under 35 U.S.C. 102 and/or 35 U.S.C. 103 is indicated where prior art discloses a product that appears to be either identical with or only slightly different from the product claimed in a product by process claim. Further, applicant can be required, to prove that the prior art product does not necessarily or inherently possess characteristics of the claimed product. Whether the rejection is based on inherency under 35 U.S.C. 102, on prima facie obviousness under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same. When, as here, there is reason to believe that the functional limitation asserted to be critical for establishing novelty in the claimed subject matter is an inherent characteristic of the prior art, the Office possesses authority to require applicant to prove that subject matter shown to be in the prior art does not possess the characteristic relied on. See *In re Fitzgerald, Sanders, and Bagheri*, 205 USPQ 594 (CCPA 1980). To this end, applicant alleges that the molded resin of

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Nishino does not possess the characteristics imparted by compression-molding. This allegation is respectfully traversed because it is unsupported by proof or a showing of facts; hence, it essentially amounts to mere conjecture. Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) (statement in publication dismissing the "preliminary identification of a human b - NGF - like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); In re Beattie, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); Ex parte George, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

The prior art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.



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***Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.***

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/3087724.



David E. Graybill  
Primary Examiner  
Art Unit 2827

D.G.  
17-Jul-02